Major Trauma Audit in Ireland

Dr. Conor Deasy, Clinical Lead, MTA, NOCA
• Right Tension Pneumothorax
• Left Haemothorax
• Grade 4 splenic laceration
• Jejunal injury with intramural haematoma
• Left distal humerus fracture
• Comminuted open left femoral shaft fracture
• Unstable T12/L1 fracture dislocation (60% off-ended)
• Multilevel spinous process and transverse process fractures
• Fractured right orbit and maxilla
• Bilateral rib fractures
• Hb 3.6g/dl (*Jehovah's Witness*)
• PS 30%
‘You can’t manage what you don’t measure’

William Edwards Deming, 1900-1993
26 HOSPITALS that receive TRAUMA

- 2 Adult Neurosurgical centres
- Pelvic Acetabular Centre
- Spinal Centre
- Burns Centre
- Cardiothoracic centres
- Plastic centres
- Maxillofacial centres
MAJOR TRAUMA AUDIT
NATIONAL REPORT 2014 -2015

Launch date: National Patient Safety Conference,
8th December, 2016
TARN Data Collection

Data collected through the patient pathway post injury
- Observations
- Interventions
- Investigations
- Clinician & Grade

Location based
- Incident
- Pre Hospital
- EM Department
- Imaging
- Theatre
- Intensive Care Unit
- Ward
- Discharge
- Rehabilitation

Inclusion Criteria
Admission > 72 hours or
- Admission to an intensive care area or
- Transferred out for continuing care or
- Transferred in for continuing care or
- Died in hospital
And whose injuries fulfill the TARN injury criteria
Participating hospitals 2014-5

- Saolta University Healthcare Group
  - Galway University Hospitals
  - Letterkenny University Hospital
- Mayo University Hospital
- Sligo University Hospital
- UL Hospital Group
  - University Hospital Limerick
- South West Hospital Group
  - Cork University Hospital
  - Mercy University Hospital
  - South Tipperary General Hospital
  - University Hospital Waterford
  - University Hospital Kerry
- Dublin Midlands Hospital Group
  - Midland Regional Hospital Tullamore
  - Midland Regional Hospital Portlaoise
  - Naas General Hospital
  - St James's Hospital, Dublin
  - Tallaght Hospital (Adult)
- Ireland East Hospital Group
  - Mater Misericordiae University Hospital
  - Midland Regional Hospital Mullingar
  - St. Luke’s General Hospital, Kilkenny
  - St. Vincent’s University Hospital
  - Waterford General Hospital
- National Children’s Hospital Group
  - Our Lady’s Children’s Hospital Crumlin
  - Tallaght Hospital (Paediatric)
  - Temple Street, Children’s University Hospital
- RCSI Hospital Group
  - Beaumont Hospital
  - Cavan General Hospital
  - Connolly Hospital
  - Our Lady of Lourdes Hospital, Drogheda

Data Quality

<table>
<thead>
<tr>
<th></th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Participating hospitals</td>
<td>22</td>
<td>24</td>
</tr>
<tr>
<td>All TARN submissions</td>
<td>3687</td>
<td>3332</td>
</tr>
<tr>
<td>Individual Patients</td>
<td>3228</td>
<td>2957</td>
</tr>
<tr>
<td>Direct Admissions</td>
<td>2954</td>
<td>2736</td>
</tr>
</tbody>
</table>

- 2014-2015
  - Data completeness - 61%
  - Data quality – 95%

- MTA should be used to quality assure and improve major trauma care in Ireland
- The role of the MTA Coordinator is critical to hospital participation in MTA.
  - Recruitment and retention of hospital MTA Coordinators will improve data completeness
Demographic Profile of major trauma patients

<table>
<thead>
<tr>
<th>Year</th>
<th>&lt; 16 Years</th>
<th>16-44 Years</th>
<th>44-64 Years</th>
<th>65-74 Years</th>
<th>≥75 Years</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td>198 (6%)</td>
<td>910 (28%)</td>
<td>879 (27%)</td>
<td>402 (12%)</td>
<td>839 (26%)</td>
</tr>
<tr>
<td>2015</td>
<td>201 (7%)</td>
<td>758 (26%)</td>
<td>811 (27%)</td>
<td>374 (13%)</td>
<td>813 (27%)</td>
</tr>
</tbody>
</table>

- < 16 YEARS: 6%
- 16 - 44 YEARS: 27%
- 45 - 64 YEARS: 27%
- 65 - 74 YEARS: 13%
- ≥75 YEARS: 27%
Cause of injury

- Fall less than 2m: 1598 (2014), 1565 (2015)
- Fall more than 2m: 494 (2014), 363 (2015)
The injuries sustained

- 23% Serious Head Injury
- 11% Serious Spinal Injury
- 35% Multiple Injuries

30% of patients were transferred to another hospital.
Major trauma patients with severe head injuries

People with a head injury who have a GCS score of 8 or lower at any time should have access to specialist treatment (NICE, 2014)

<table>
<thead>
<tr>
<th></th>
<th>Direct admission to Neurosurgical centre</th>
<th>Transfer to Neurosurgical centre</th>
<th>Not transferred to Neurosurgical centre</th>
</tr>
</thead>
<tbody>
<tr>
<td>2014</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe TBI (AIS 3+, GCS ≤ 8)</td>
<td>27 (19%)</td>
<td>70 (49%)</td>
<td>47 (33%)</td>
</tr>
<tr>
<td>2015</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Severe TBI (AIS 3+, GCS ≤ 8)</td>
<td>24 (20%)</td>
<td>38 (32%)</td>
<td>58 (48%)</td>
</tr>
</tbody>
</table>

Equity of access to expertise in trauma care is required to maximise patient outcomes.
Reception of major trauma patients in hospital

<table>
<thead>
<tr>
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<th>2014</th>
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</tr>
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<tbody>
<tr>
<td><strong>All patients received by a trauma team</strong></td>
<td>410 (14%)</td>
<td>253 (9%)</td>
</tr>
<tr>
<td><strong>Trauma team led by a Consultant (at 30 minutes)</strong></td>
<td>240 (59%)</td>
<td>164 (65%)</td>
</tr>
<tr>
<td><strong>All severely injured patients (ISS&gt;15) received by a trauma team</strong></td>
<td>212 (23%)</td>
<td>140 (15%)</td>
</tr>
<tr>
<td><strong>Severely injured patients (ISS&gt;15): Trauma Team led by a Consultant (at 30 minutes)</strong></td>
<td>140 (66%)</td>
<td>102 (73%)</td>
</tr>
</tbody>
</table>

Clear national guidance is required to support hospitals in developing trauma teams which have been shown to improve timeliness to critical interventions and patient outcomes.
## Hospital systems performance

### ICU LOS (Days) for all major trauma patients

<table>
<thead>
<tr>
<th>Year</th>
<th>2014</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>n</td>
<td>399 (14%)</td>
<td>336 (12%)</td>
</tr>
<tr>
<td>Median (IQR)</td>
<td>3 (1-6 days)</td>
<td>2 (1-5 days)</td>
</tr>
<tr>
<td>ICU bed days</td>
<td>2345</td>
<td>1377</td>
</tr>
</tbody>
</table>

MTA should be used to inform ICU bed capacity requirements

### Hospital LOS (Days) for all major trauma patients

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<thead>
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<tbody>
<tr>
<td>Median (IQR)</td>
<td>7 (4-15 days)</td>
<td>7 (4-14 days)</td>
</tr>
</tbody>
</table>
### Outcome following major trauma

- Outcomes data is available for 5209 (84%) submissions.
  - Challenge: tracking patients through multiple hospital transfers
- 4925 (95%) survived, 284 (5%) confirmed deaths across the two years.

### Mortality of major trauma patients

<table>
<thead>
<tr>
<th></th>
<th>Young population (n=16)</th>
<th>Working age population (n=117)</th>
<th>Older population (n=151)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Median Age</strong></td>
<td>11 years (5-14 years)</td>
<td>44 years (30-56 years)</td>
<td>83 years (77-89 years)</td>
</tr>
<tr>
<td><strong>Gender</strong></td>
<td>Male 75%</td>
<td>Male 76%</td>
<td>Female 51%</td>
</tr>
<tr>
<td><strong>Predominant cause of injury</strong></td>
<td>Other asphyxia/drowning 50%</td>
<td>Other asphyxia/drowning: 28%</td>
<td>Falls less than 2m: 75%</td>
</tr>
<tr>
<td><strong>Median ISS (IQR)</strong></td>
<td>25 (25-26)</td>
<td>25 (25-30)</td>
<td>25 (16-26)</td>
</tr>
</tbody>
</table>
Risk-adjusted benchmarking: Case mix standardised rate of survival for Ireland

- Ireland Ws score: 1.7 (95% CI 1.1 - 2.2)
  - Caveat: a more complete data set will influence the Ws score.

- Variation in Ws at hospital level: -2.4 (-6.4 – 1.5, 95% CI) to 3.9 (0.1 - 8, 95% CI)
  - 21 hospitals were included
  - Number of discharges ranged between 52 to 948 per hospital, with 11 hospitals having less than 200 approved submissions.

→ functional status and quality of life outcomes
Key take home messages

• Robust data
• QA & QI tool
• Audit culture
• Monitors equity of access to care
• Trauma teams
• Functional and quality of life patient outcomes
• MTA supports the development of a national trauma system by providing robust data
• Trauma demographics inform prevention and treatment needs
Thanks to:

- Marina Cronin, Debbie McDaniel, Aisling Connolly, NOCA
- The TARN team